

**CLAIMS**

What is claimed is:

Claim 1. An interposer comprising:

an array of buttons on a carrier having a proximity to each other that  
5 allows contact between two adjacent buttons to occur when the two adjacent  
buttons are compressed above a predetermined threshold.

Claim 2. The interposer of claim 1, wherein the contact between the two  
adjacent buttons occurs when the two adjacent buttons are axially compressed  
10 above a predetermined threshold.

Claim 3. The interposer of claim 1, wherein the array of buttons is  
arranged in a regularly spaced array.

15 Claim 4. The interposer of claim 1, wherein the array of buttons is  
arranged in a custom arrangement based upon positions of the contacts on one  
of a chip carrier and a printed circuit board.

Claim 5. The interposer of claim 1, wherein a rate at which the radius of  
20 at least one of the buttons expands while being axially compressed slows at a  
first range of axial compression.

Claim 6. The interposer of claim 5, wherein the rate at which the radius

of the two buttons expand while being axially compressed slows at a second range of axial compression.

Claim 7. The interposer of claim 1, wherein the buttons comprise an  
5 elastomeric compound that has embedded metallic particles.

Claim 8. The interposer of claim 1, wherein the buttons comprise a deformable material.

10 Claim 9. The interposer of claim 8, wherein the buttons comprise a deformable metal.

Claim 10. The interposer of claim 9, wherein the buttons comprise soft metal balls.

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Claim 11. A chip package comprising:

a chip having a first surface and a second surface;

a printed circuit board having a first surface and a second surface,

wherein the first surfaces are closer to each other than the second surfaces;

20 and

an interposer having an array of buttons between said chip and said printed circuit board.

Claim 12. The package of claim 11, wherein at least one button of the array of buttons is compressed between said first surfaces.

Claim 13. The package of claim 12, wherein said at least one button  
5 contacts an adjacent button in the array of buttons.

Claim 14. The package of claim 12, wherein at least one other button of the array of buttons is compressed between said second surfaces.

10 Claim 15. The package of claim 14, wherein said at least one button of the array of buttons comprises a plurality of buttons compressed between said first surfaces and surrounding said at least one other button of the array of buttons compressed between said second surfaces.

15 Claim 16. The package of claim 15, wherein the plurality of buttons compressed between said first surfaces are compressed above a predetermined threshold such that adjacent buttons of the plurality of buttons contact each other.

20 Claim 17. The package of claim 16, wherein the plurality of buttons compressed between said first surfaces and said at least one other button of the array of buttons compressed between said second surfaces form at least one coaxial transmission line.

Claim 18. The package of claim 17, wherein the at least one coaxial transmission line supports a transverse electro-magnetic mode of propagation across a wide frequency band.

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Claim 19. The package of claim 17, wherein the at least one coaxial transmission line provides a predetermined impedance across a frequency band.

10 Claim 20. The package of claim 19, wherein the predetermined impedance is between about 50 Ohms and 100 Ohms.

Claim 21. The package of claim 19, wherein the wide frequency band is about 3 GHz wide.

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Claim 22. The package of claim 11, wherein the array of buttons is arranged in a regularly spaced array.

Claim 23. The package of claim 11, wherein the array of buttons is  
20 arranged in a custom arrangement based upon positions of the contacts on one of the chip carrier and the printed circuit board.

Claim 24. The package of claim 11, wherein a rate at which the radius of

at least one button of the buttons expands while being axially compressed slows at a first range of axial compression.

5 Claim 25. The package of claim 24, wherein the rate at which the radius of the at least one button expands while being axially compressed slows at a second range of axial compression.

10 Claim 26. The package of claim 11, wherein at least one button of the buttons comprise an elastomeric compound having embedded metallic particles.

Claim 27. The package of claim 11, wherein the buttons comprise a deformable material.

15 Claim 28. The package of claim 27, wherein the buttons comprise a deformable metal.

Claim 29. The package of claim 28, wherein the buttons comprise soft metal balls.

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Claim 30. The package of claim 11, further comprising a clamping ring holding the chip against the interposer and the interposer against the printed circuit board.

Claim 31. The package of claim 11, wherein the chip comprises laminations that form said first surface and said second surface.

5 Claim 32. The package of claim 11, wherein the printed circuit board comprises laminations that form said first surface and said second surface.

Claim 33. A chip package comprising:

a chip carrier;

10 a printed circuit board;

an interposer having an array of buttons between said chip carrier and said printed circuit board; and

a sheet positioned between the interposer and one of the chip carrier and the printed circuit board,

15 wherein the sheet defines a first hole through which a first button of the array of buttons passes and a second hole through which a second button of the array of buttons passes, and

wherein the first hole compresses the first button more than the second hole compresses the second button.

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Claim 34. The package of claim 33, wherein the second hole is large enough such that the second button does not contact the sheet.

Claim 35. The package of claim 33, wherein the first button is compressed such that the first button radially contacts an adjacent button.

Claim 36. A chip package comprising:

- 5 a chip carrier;
- a printed circuit board;
- an interposer having an array of buttons between said chip carrier and said printed circuit board; and
- a sheet positioned between the interposer and one of the chip carrier
- 10 and the printed circuit board,
- wherein the sheet defines a hole through which a first button of the array of buttons passes and comprises a conductive disc axially compressing a second button of the array of buttons.

15 Claim 37. The package of claim 36, wherein the second button is axially compressed such that the second button radially contacts an adjacent button.

Claim 38. A method of making a chip package comprising:

- providing an interposer having an array of buttons on a carrier having
- 20 a proximity to each other that allows contact between two adjacent buttons to occur when the two adjacent buttons are compressed above a predetermined threshold; and
- compressing the interposer between a chip carrier and a printed circuit

board.

Claim 39. A method of making a chip package comprising:

providing an interposer having an array of buttons;

5 providing a sheet having a hole and a conductive disc;

positioning the interposer between a chip carrier and a printed circuit board; and

positioning the sheet between the interposer and one of the chip carrier and the printed circuit board such that a first button of the array of buttons

10 passes through the hole in the sheet and such that a second button of the array of buttons is axially compressed by the conductive disc.